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## The Genus *Reduvius* Fabricius in Western North America (Reduviidae, Hemiptera, Insecta)

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The genus *Reduvius* Fabricius is predominantly Holarctic, Ethiopian, and Oriental in distribution, with the largest number of species occurring in the Palearctic and Ethiopian regions. One species, *Reduvius personatus* (Linnaeus), originally Palearctic, has been carried by man to Australia, northern South America, and North America; it is common in the United States. All other species have restricted ranges, as far as is known.

In addition to the introduced *personatus*, three native species are found in North America, in the southwestern United States, and in the adjacent regions of Mexico. The first of these species, *senilis*, was recognized and described by Van Duzee (1906). The species name *senilis* has been used in the literature with some frequency, but the later recognition of a second nearly related species, *sonoraensis* Usinger (1942) partially sympatric with *senilis*, and the discovery of a third equally very similar species, herein described, cast doubt on the correctness of some of the former identifications of *senilis*.

Though we have no doubts about the generic placement of these species, we have been unable to establish their exact position within the very large genus *Reduvius*. The genus was revised first by Reuter (1892).

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The description of various additional species by subsequent authors was climaxed by the arrangement of most of these in several species groups by Miller (1951, 1955). Miller (1955) was well aware of the existence of native American species which he mentioned but did not place in any of his groups.

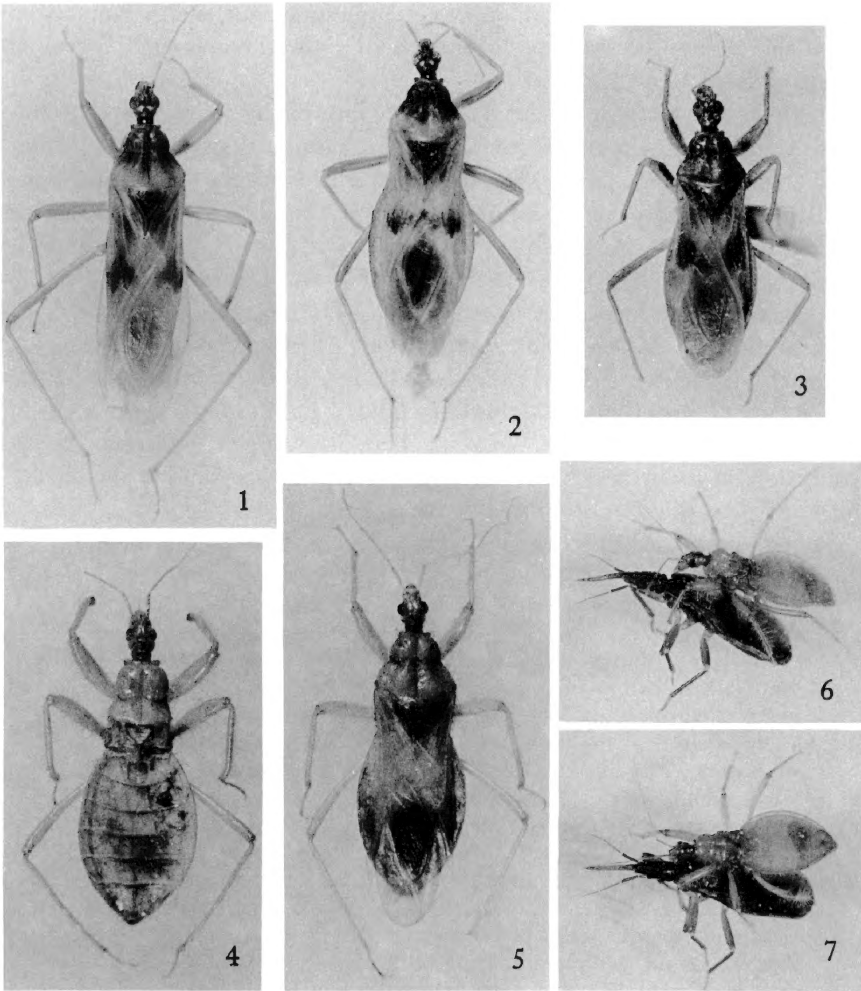
For the time being, we consider the native American species as forming a group of their own, the *senilis* group, named for the oldest species. The group can be characterized as follows:

Medium-sized insects (9–14 mm). General color from stramineous to testaceous; legs of the general body color, concolorous, not annulated; head, thorax, and forewings variously suffused with darker. Head, thorax, abdomen, and legs with numerous long hairs. First segment of hind tarsus much shorter than second or third. Ventral surface of abdomen carinate throughout along middle, from second to seventh segments. Parameres of males visible with pygophore *in situ*. Pygophore subsemicircular in lateral outline; its process transverse, low; lateral angles of process hook-like.

The phallus of the species of the *senilis* group is much like that in *Reduvius personatus*, the type species of the genus, as illustrated by Lent and Wygodzinsky (1947). The only other illustrations of the phallus of *Reduvius* we have been able to find are those given by Villiers (1948), but they are not detailed enough for comparative purposes. We have found certain structures of the phallus to be more constant than size and color of individuals, and thus useful for taxonomic purposes; these structures, which have been used in our keys and descriptions, are indicated in figure 17. All other terms used in the text of this paper are self-explanatory.

Available data (see fig. 42) indicate that the species of the *senilis* group are restricted to semi-arid regions, as are most other species of *Reduvius*. *Reduvius senilis* occurs in zones with summer and winter rains, but not where the summer rains are absent; *vanduzeei* seems to concentrate in summer-dry areas, and *sonoraensis* occurs over virtually the whole range of the group. The greater adaptability of the last species is possibly also expressed by the fact that it is the only one with macropterous as well as micropterous forms; the reduction or loss of forewings and hind wings is in reduviids frequently correlated with extreme ecological conditions, such as found in arid zones.

Species of the *senilis* group have been reported from lodges of wood rats (*Neotoma* sp.) (Ryckman, 1954) and have been observed to feed under laboratory conditions on species of *Triatoma* that are found in wood-rat nests, as well as on other triatomines and other insects (Wood, 1954b; Ryckman, 1954); our own observations have confirmed this (figs. 6, 7).



FIGS. 1, 2. *Reduvius vanduzeei*. 1. Male holotype, Monument Valley, Utah. 2. Male, La Grange, California.

FIG. 3. *Reduvius senilis*, male, Gila Bend, Arizona.

FIGS. 4-7. *Reduvius sonoraensis*. 4. Micropterous female, Tucson, Arizona. 5. Macropterous male, Tucson, Arizona. 6, 7. Micropterous female, Marjilda Canyon, Arizona, feeding on *Triatoma* nymph in laboratory.

Specimens of the *senilis* group have also been collected in and about dwellings (Wood, 1954a, 1954b) and at light (Wood, 1954b; many labels on specimens); one individual of *sonoraensis* was collected by us under the bark of a dead tree. As in other species of *Reduvius*, the nymphs of the

native American species camouflage themselves with small particles of dust and debris that adhere to their bodies (Ryckman, 1954; personal observations).

The present work has been greatly facilitated by loans from the following institutions and individuals to whom we are much obliged: Dr. J. Herring, Division of Insects, United States National Museum of the Smithsonian Institution, Washington, D. C.; Dr. C. Hogue, Department of Entomology, Los Angeles County Museum; Mr. A. T. McClay, Department of Entomology, University of California, Davis; Dr. J. Powell, California Insect Survey, University of California, Berkeley; Dr. E. S. Ross and Dr. C. D. MacNeill, Department of Entomology, the California Academy of Sciences, San Francisco; Dr. R. E. Ryckman, Loma Linda University, Loma Linda, California; and Dr. F. Werner, Department of Entomology, University of Arizona, Tucson, Arizona. Material in the collections of the American Museum of Natural History and in the second author's private collection has also been used.

All drawings and photographs were made by the first author.

#### KEY TO THE SPECIES OF *Reduvius* FOUND IN NORTH AMERICA

1. Length over 15 mm.; general color dark brown; the three tarsal segments of hind legs subequal in length; only second and base of third abdominal sternites carinate along middle; parameres of male not visible with pygophore *in situ* . . . . . *personatus* (Linnaeus)  
Length under 15 mm.; general color yellowish; first tarsal segment of posterior tarsus much shorter than second or third; ventral surface of abdomen sharply carinate throughout along middle, from second to seventh segments; parameres of male visible with pygophore *in situ* . . . . . 2
2. Eyes not attaining level of under surface of head, in lateral aspect (figs. 9, 11); second rostral segment 1.25–1.4 times as long as first; spongy fossa of fore tibia not over one-tenth of length of tibia (fig. 12); scutellar process very short and stout, cylindrical (figs. 8, 10); phallus with basal plate projections very small and lateroventral sclerotization of phallosome well developed (figs. 16–18); macropterous or micropterous . . . . . *sonoraensis* Usinger  
Eyes attaining level of under surface of head, in lateral view (figs. 22, 31); second rostral segment not over 1.2 times as long as first; spongy fossa of fore tibia from one-fifth to one-eighth of length of tibia (figs. 23, 32); scutellar process slender, laterally compressed, somewhat pointed; phallus with basal plate projections better developed and lateroventral sclerotization of phallosome not perceptible (figs. 26, 27, 38, 39); only macropterous form known . . . . . 3
3. Length 13 mm. or more; fore femur 5.8–6.9 times as long as maximum width (fig. 32); surface of hind lobe of pronotum generally dull; phallus with basal plate projections narrowed apically (figs. 38, 39), posterosuperior projection of struts well developed (fig. 38) . . . . . *vanduzeei*, new species  
Length 11 mm. or less; fore femur not over five times as long as its maximum

width (fig. 23); surface of hind lobe of pronotum always shining; phallus with basal plate projections broadly rounded (figs. 26, 27), posterosuperior projection obsolete (fig. 26) . . . . . *senilis* Van Duzee

*Reduvius personatus* (Linnaeus)

This species is common in many areas of the United States, especially in the east and northwest, including the northern Great Basin. We have seen many specimens from the states of Washington, Oregon, Utah, Nevada, and Colorado, and also some from Arizona, but the species is significantly very rare in California, never having been reported in the literature; we have seen only one specimen: "Kern R. Co. Pk.," Kern County, June 27, 1949 (L. W. Isaak), one male, in the Department of Entomology, University of California, Davis.

The literature on *Reduvius personatus*, a common household species in most of its range, is ample; in this country, Readio (1927) described its life history. Lent and Wygodzinsky (1947) illustrated and briefly described the male and female copulatory organs for the first time in some detail.

Though this species is normally associated with human habitations, some of the western specimens we have seen were apparently free-living. The drier conditions prevailing in parts of the American west have obviously enabled the species to re-enter its primitive habitat.

*Reduvius sonoraensis* Usinger

Figures 4-21

*Reduvius sonoraensis* USINGER, 1942, p. 198 [Isla La Raza, Gulf of California].

Males macropterous or micropterous, females micropterous.

MACROPTEROUS MALE: Length to apex of hemelytra, 8.8-12.0 mm.

General color from stramineous to testaceous, head and thorax with scutellum frequently luteous, concolorous. Hemelytra stramineous, center of membrane suffused with brown, apex of membrane whitish (fig. 5). Antennae, legs, and abdomen of general body color, concolorous.

Head as shown in figures 5 and 11. Eyes small, narrow, not quite attaining level of under surface of head, their distance ventrally about same as dorsally; dorsal interocular distance from one and one-half to twice the width of one eye. Ocelli large, interocellar distance equal to twice the width of one ocellus; distance from ocellus to eye smaller than width of ocellus. Ratio of length of first to second antennal segments, 0.54-0.58. Rostrum as shown in figure 11, second segment distinctly longer than

first (1.25–1.4/1). Juga subangular in lateral view.

Pronotum as shown in figures 5 and 11; hind lobe one and one-third times as long as fore lobe, its hind border distinctly rounded. Process of scutellum very short and stout, subcylindrical, bluntly rounded apically in dorsal view, truncate in lateral view.

Hemelytra surpassing apex of abdomen by 1.0–1.5 mm.

Ratio of length to maximum width of fore femur, 5.0–6.0. Fore tibia and mid-tibia slightly curved apically. Spongy fossa of fore tibia from one-tenth to one-eleventh of length of tibia, spongy fossa of mid-tibia very small, from one-twentieth to one-twenty-fifth of length of article.

Genitalia of male as shown in figures 14 to 18. Sclerotized portion of basal plate projections very small. Lateroventral sclerotization of phalotheca distinct. Posterosuperior projection of struts large, its upper border distinctly rounded.

**MICROPTEROUS MALE:** Length, 8.8–10.0 mm.

General color from fulvous to testaceous, head in some specimens darker. Surface of body and appendages slightly shining. Long hairs abundant, more dense than in macropterous form, especially on thorax.

Head as shown in figures 8 and 9. Eyes smaller than those in macropterous form, distinctly remote from level of under surface of head; dorsal interocular distance of eyes equal to twice their width. Ocelli small, interocellar distance over twice the width of one ocellus, distance from ocellus to eye larger than width of ocellus. Ratio of lengths of first and second antennal segments, 0.58–0.62. Rostrum as shown in figure 9, second segment distinctly longer than first (1.3–1.4/1). Juga like that in macropterous form.

Pronotum as shown in figures 8 and 9; posterior lobe reduced, about as long as fore lobe, its hind border very faintly rounded, almost straight across. Scutellum like that in macropterous form. Wing pads not or only very slightly surpassing apex of scutellar spine, very hairy, coarsely rugose transversely.

Shape of forelegs as shown in figure 12; fore tibia and mid-tibia distinctly curved apically. Proportions of fore femur and relative size of spongy fossae of fore tibia and mid-tibiae like those in macropterous form.

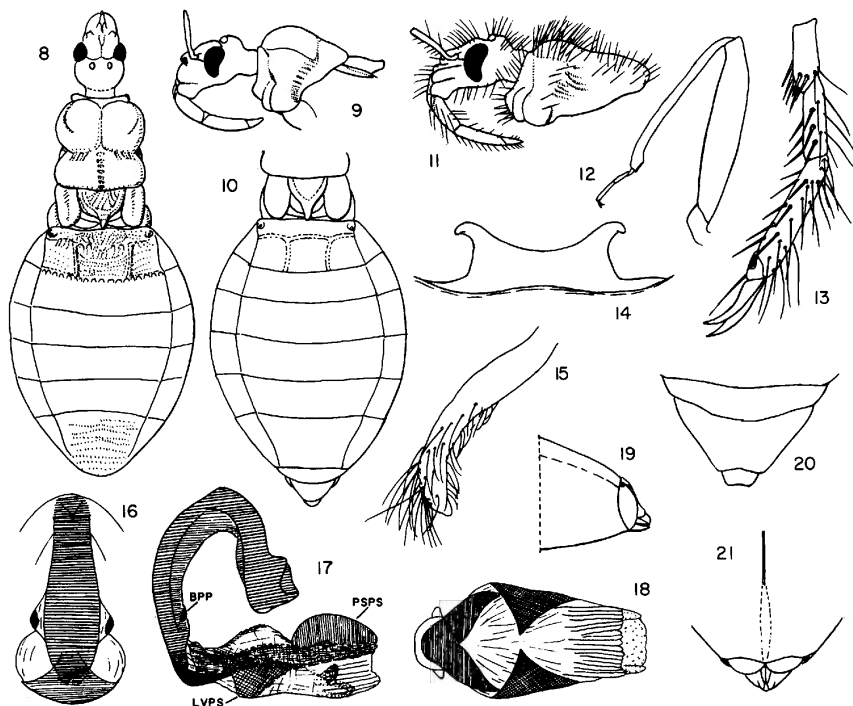
Shape and surface structure of abdomen as shown in figure 8. Size and structure of genitalia like those in macropterous form.

**MICROPTEROUS FEMALE:** Length, 9.8–11 mm.

Color and surface structure like those in micropterous male.

Head like that of micropterous male, but eyes even smaller, interocular distance dorsally slightly over twice the width of eyes (fig. 4).

Pronotum (fig. 4) much like that in micropterous male, but hind lobe more strongly reduced, only about two-thirds as long as fore lobe, the



FIGS. 8-21. *Reduvius sonoraensis*. 8, 9. Micropterous male, Bahía San Pedro. 8. Dorsal view, sculpture elements shown for basal and last tergites only; pilosity not shown. 9. Head and prothorax, lateral view. 10. Female paratype, dorsal view of mesothorax, metathorax, and abdomen, schematic. 11. Winged male, Tucson, head and prothorax, lateral view. 12. Foreleg of apterous male, Iron Canyon. 13-18. Macropterous male, Tucson. 13. Anterior tarsus. 14. Posterior projection of pygophore. 15. Paramere. 16. Phallus, anterior view. 17. Phallus, lateral view. 18. Phallus, ventral view. 19-21. Female paratype, genital region. 19. Lateral view. 20. Posterodorsal view. 21. Seen from below.

**Abbreviations:** BPP, basal plate projection; LVPS, lateroventral phallotheca sclerotization; PSPS, posterosuperior projection of struts.

latter more strongly convex than that of male. Scutellum, wing pads, and legs like those in micropterous male.

Surface structure of abdomen like that in micropterous male. Shape of abdomen and of genital region as shown in figures 10, and 19 to 21.

This species has been known from the micropterous male and female. The fully winged male is here described for the first time; it does not seem to occur over the whole range of the species (see fig. 42). These macropterous males are considered as belonging to *sonoraensis* not only because they differ from the always macropterous males of the other two

species, but also because they agree with the micropterous form of *sonoraensis* in size, the generally very pale color, the small eyes, the relatively long second rostral segment, the very short spongy fossa of the fore tibia, the short and stout scutellar process, and the structure of the phallus.

**MATERIAL EXAMINED:** United States: *California*: One to 2 miles west of Lone Pine, Inyo County, April 27, 1960 (Gertsch, Ivie, and Schrammel), one micropterous female, in the American Museum of Natural History; Iron Canyon, 1.5 miles northeast of Garlock, Kern County, April 13, 1960 (C. A. Toschi), one micropterous male, in the California Insect Survey; Cronise Valley, San Bernardino County, April 29, 1956 (B. J. Adelson), one macropterous male, in the California Insect Survey; Hopkins Well, Riverside County, April 20, 1952 (J. G. Rozen), one macropterous male, in the California Insect Survey; same locality, April 16, 1958 (J. Powell), two winged males, in the American Museum of Natural History, and the California Insect Survey; Desert Side, San Jacinto Mountains [Riverside County], April 12, 1939 (E. C. Van Dyke), one winged male, in the California Insect Survey; Borrego Valley, San Diego County, April 29, 1961 (Rozen and Schrammel), one micropterous male and one micropterous female, in the American Museum of Natural History; Borrego, San Diego County, April 21, 1960 (J. Powell), one micropterous female, in the California Insect Survey; May 3, 1956 (M. Wasbauer), one micropterous female, in the California Insect Survey. *Arizona*: Yuma [Yuma County], April 9 and 18, 1960, at light (D. Muse), two macropterous males, in the Department of Entomology, University of Arizona; Ehrenberg [Yuma County], April 19, 1939 (F. H. Parker), one macropterous male, in the California Academy of Sciences; Tucson, May 1, 1940, under stone (Bryant), one micropterous female, in the American Museum of Natural History; Tucson, May 1, 1947, in house near light (L. P. Wehrle), one macropterous male, in the Department of Entomology, University of Arizona; Tucson, April 20, 1927, one macropterous male, in the California Academy of Sciences; Marijilda Canyon, Graham Mountains, 4000 feet, under bark of dead tree, April 7, 1961 (Wygodzinsky), micropterous female obtained in laboratory from nymph, in the American Museum of Natural History. *Texas*: Presidio [Presidio County], April 18, 1955 (J. H. Russell), one macropterous male, in the United States National Museum.

Mexico: *Sonora*: Nogales, March 25, 1957, railroad box car, one micropterous male, in the United States National Museum; Bahía San Pedro, April 4, 1953 (Figg-Hoblyn), one micropterous male, in the California Academy of Sciences. *Baja California*: Isla San Esteban, April 3, 1953



(Figg-Hoblyn), one micropterous female, in the California Academy of Sciences.

*Reduvius senilis* Van Duzee

Figures 3, 22–29

*Reduvius (Opsicoetus) senilis* VAN DUZEE, 1906, p. 390 [Baboquivari Mountains, Arizona].

Macropterous in both sexes. Length of male to apex of hemelytra, 9.5–11.1; of female to apex of abdomen, 8.5–10.8 mm.

General color testaceous. Head fuscous, anterior portion and rostrum generally somewhat lighter. Pronotum and scutellum from castaneous to fuscous, concolorous, or fore lobe of pronotum lighter than hind lobe. Mesopleura and metapleura in many cases darkened. Hemelytra stramineous to testaceous; basal three-fourths of clavus, a large spot on center of corium not attaining costal margin and continuing narrowly and somewhat less distinctly almost to axillary region, and membrane entirely, brown (fig. 3). Antennae, legs, and abdomen of the general body color, concolorous.

Head, thorax, genital region, legs, and forewings shining, fore lobe of pronotum polished. Body and appendages with numerous erect to inclined yellowish hairs.

Head as shown in figures 3 and 22. Eyes attaining under surface of head, in both sexes, their distance ventrally much shorter than dorsally; dorsal interocular distance about one and one-half times their width in female, from one and one-third to one and one-fifth times their width in male. Ratio of lengths of first and second antennal segments, 0.5–0.57. Rostrum as shown in figure 22, second segment very slightly longer than first (1.1/1). Juga rounded in lateral view.

Pronotum as shown in figures 3 and 22. Process of scutellum relatively slender, slightly compressed laterally, apex narrowly rounded, slightly upturned.

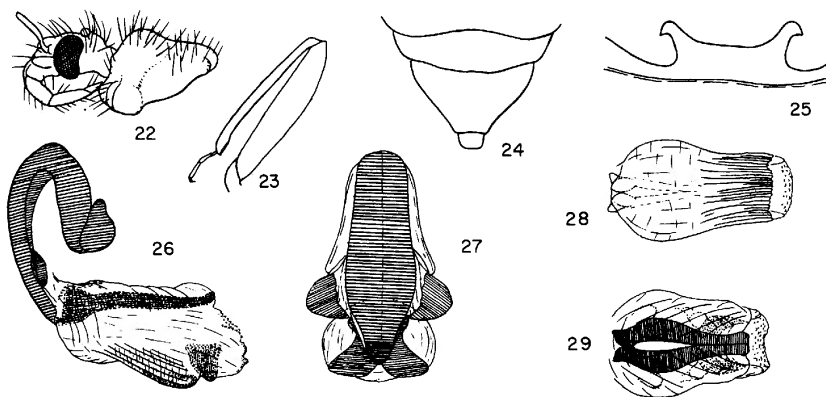
Hemelytra of male attaining or slightly surpassing apex of abdomen, those of female not reaching beyond eighth tergite.

Shape of forelegs as shown in figure 23. Fore tibia and mid-tibia slightly curved apically. Ratio of length to maximum width of fore femur, 4.4–5.0. Spongy fossa of fore tibia approximately one-seventh as long as tibia, of mid-tibia from one-tenth to one-fifth of length of article.

Genitalia of male as shown in figures 25 to 29. Basal plate projections large, broadly rounded. Lateroventral sclerotization of phallosome not distinct. Posterosuperior projection of struts obsolete.

Dorsal view of genital region of female as shown in figure 24.

**MATERIAL EXAMINED:** United States: *Arizona*: Gila River at Geronimo, Graham County, 2600 feet, willow-mesquite-cottonwood area (W. Nutting, F. Werner), one male, one female, in the Department of Entomology, University of Arizona; Gila Bend [Maricopa County], August 22, 1933 (H. S. Gentry), one male, in the California Academy of Sciences; Organ Pipe National Monument, Pima County, June 10, 1952 (W. Gertsch, R. Schrammel), one male, in the American Museum of Natural



FIGS. 22-29. *Reduvius senilis*. 22. Male, Sabino Canyon, lateral view of head and prothorax. 23. Outlines of foreleg of female, Lowell Ranger Station. 24. Posterodorsal view of genital region of female, Tucson. 25-29. Male, Sabino Canyon. 25. Projection of pygophore. 26. Phallus, lateral view. 27. Phallus, anterior view. 28. Phallosome, ventral aspect. 29. Phallosome, seen from above.

History; Quitobaquito, Organ Pipe National Monument, Pima County, June 13, 1952 (M. Cazier, W. Gertsch, R. Schrammel), one female, in the American Museum of Natural History; Kitts Peak Rincon, Baboquivari Mountains [Pima County], about 4050 feet, August 1-4, 1916, one male, in the American Museum of Natural History; Tucson [Pima County], August 26, 1935 (O. Bryant), two males, in the California Academy of Sciences; Tucson, at lights, August 9, 1928 (A. A. Nichol), one male, in Usinger's collection; Desert Museum, Tucson Mountains [Pima County], August 28, 1955, light trap, (G. Butler, F. Werner), one male, in the Department of Entomology, University of Arizona; same locality, August 12, 1955 (G. Butler, F. Werner), one male, in the Department of Entomology, University of Arizona; Sabino Canyon, Santa Catalina Mountains [Pima County], October 5, 1915 (J. F. Tucker),

two males, in the California Academy of Sciences; same locality, July 30, 1954, at light (F. G. Werner), two males, in the Department of Entomology, University of Arizona; Lowell Ranger Station, Pima County, about 2700 feet, July 6–20, 1916, one female, in the American Museum of Natural History; Santa Catalina Mountains, "Htchk. Hwy." mile 6.5, July 14, 1955, at light (G. Butler, F. Werner), two males, in the Department of Entomology, University of Arizona; Patagonia, Santa Cruz County, July, 1936 (E. S. Ross), one male, in Usinger's collection; Santa Rita Mountains, July 26, 1925, one male, in the United States National Museum; Cochise Stronghold, Dragoon Mountains [Cochise County], July 10, 1955 (F. Werner and G. Butler), one female, in the Department of Entomology, University of Arizona; Dragoon, Cochise County, June, 1917 (Bequaert), one specimen, in the United States National Museum; same locality, July 20, 1917, two males, in the American Museum of Natural History; San Bernardino [Cochise County], August 7, 1955 (Butler and Noon), one male, in the Department of Entomology, University of Arizona.

Mexico: *Sonora*: Sonoyta, April 13, 1960 (Ryckman and Olsen), several males, females, and nymphs, in the American Museum of Natural History, and in Usinger's collection; Desemboque, August 20–31, 1953 (B. Malkin), one male, one female, in the California Academy of Sciences; Tiburón Island, north end, July 9, 1952 (C. and P. Vaurie), two males, in the American Museum of Natural History; 13 kilometers southwest of Navojoa, August 22, 1954 (R. Ryckman, C. P. Christianson, D. Spencer), one female, in Usinger's collection.

### ***Reduvius vanduzeei*, new species**

Figures 1, 2, 30–41

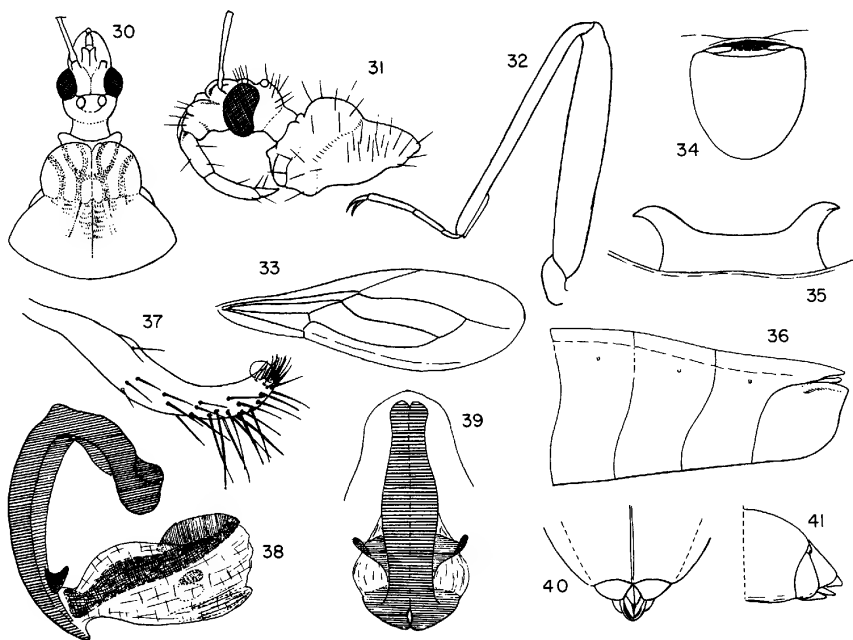
*Reduvius senilis*: USINGER, 1933, p. 171 (*nec* Van Duzee).

*Reduvius senilis* (*sic*): RYCKMAN, 1954, p. 88 (*nec* Van Duzee).

Macropterous in both sexes. Length of male to apex of hemelytra, 13–14 mm.; of female to apex of abdomen, 13 mm.

General color testaceous. Head (in some with exception of anterior portion and rostrum), fore lobe and anterior third of hind lobe of pronotum, and scutellum all from fuscous to piceous; posterior two-thirds of hind lobe of pronotum of the general body color; apex of scutellum and its spine lighter than disc. Lateral portion of prothorax (with exception of acetabulum), mesopleura and metapleura, and in some specimens also prosternum, more or less conspicuously darkened. Hemelytra (figs. 1, 2) stramineous to testaceous; a spot on clavus slightly behind middle

and a small spot on adjacent portion of corium, a large spot on middle of corium which may attain costal margin but does not perceptibly extend toward axillary region, and membrane with exception of basal portion of cells, fumose or distinctly brown. Antennae, legs, and abdomen of general body color, concolorous, in some specimens fore coxae somewhat darkened.



FIGS. 30-41. *Reduvius vanduzeei*, Monument Valley, Utah. 30, 31. Paratype male, head and thorax. 30. Dorsal view, hairs not shown. 31. Lateral view, hairs shown. 32, 33. Female allotype. 32. Outlines of foreleg. 33. Forewing, schematic. 34-39. Paratype male. 34. Posterior view of pygophore. 35. Projection of pygophore. 36. Posterior portion of abdomen, lateral view. 37. Paramere. 38. Phallus, lateral view. 39. Phallus, anterior view. 40, 41. Female allotype. 40. Genital region, ventral aspect. 41. Genital region, lateral aspect.

Head, thorax with fore lobe of pronotum, genital region, legs, and forewings shining; hind lobe of pronotum rarely slightly shining, generally matte. Body and appendages with numerous erect or inclined yellowish hairs.

Head as shown in figures 1, 2, 30, and 31. Eyes attaining under surface of head, in both sexes, their distance ventrally much less than dorsally. Dorsal interocular distance about one and one-third of their width, in

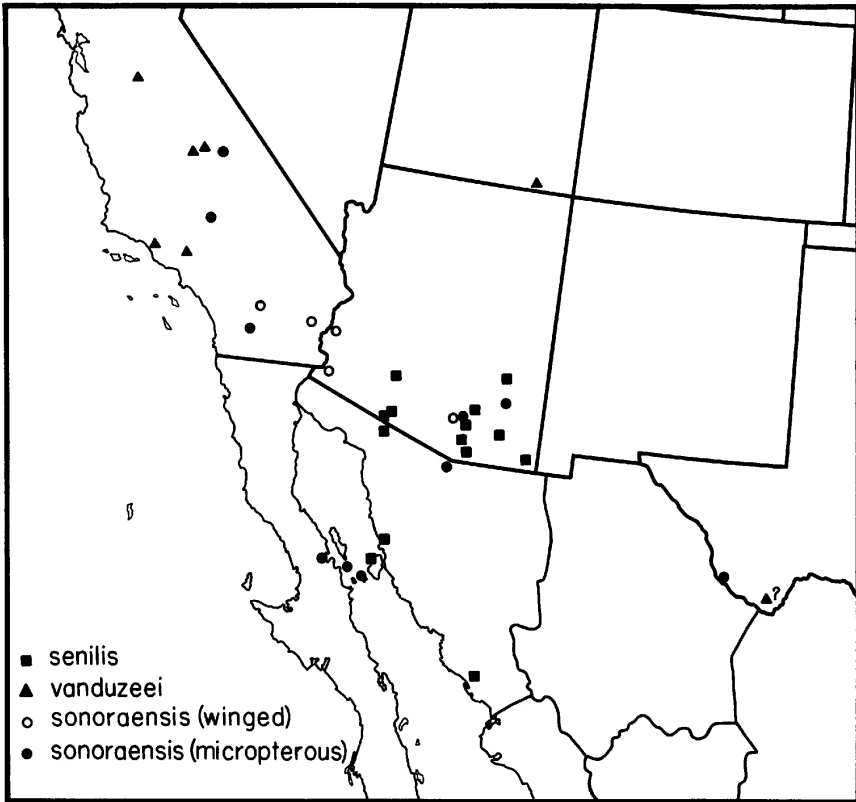


FIG. 42. Distribution of the native American species of *Reduvius*.

male and female. Ratio of lengths of first and second antennal segments, 0.43–0.55, in both sexes. Rostrum as shown in figure 31, second segment distinctly though slightly longer than first (1.1–1.2/1). Jugal rounded in lateral view.

Pronotum as shown in figures 1, 2, 30, and 31. Process of scutellum slender, slightly compressed laterally, apex almost pointed, not or only slightly upturned.

Forewings of male surpassing apex of abdomen by 0.2–1.0 mm., those of female not surpassing eighth tergite.

Shape of forelegs as shown in figure 32. Fore tibia and mid-tibia straight. Ratio of length to maximum width of fore femur, 5.8–6.9. Spongy fossa of fore tibia very variable in length, from slightly less than one-fourth to approximately one-ninth of length of tibia; spongy fossa of mid-tibia from one-ninth to one-tenth as long as article.

Genitalia of male as shown in figures 34 to 39. Basal plate projections medium-sized, conspicuously narrowed on apical half. Lateroventral sclerotization of phallosome not distinct. Posterosuperior projection of struts large, well developed, its upper border only faintly rounded.

Dorsal view of female genital region like that in *senilis* (see fig. 24); lateral and ventral aspects as shown in figures 40 and 41.

The new species, named for Edward P. Van Duzee who described the first native American *Reduvius*, is closer to *senilis* than to *sonoraensis*; it differs from the former by the features indicated in the key, and by color characters apparent from our descriptions and photographic illustrations.

A male from Texas, far east of the main range of the species (fig. 42), is atypical in that its corium is concolorous and the membrane is suffused with dark as in the macropterous form of *sonoraensis*; the hook-like processes of the projection of the pygophore are longer than in typical *vanduzeei*, but all other morphological characters agree with those of Utah and California individuals. Until additional material becomes available, the Texas specimen is considered as belonging to *vanduzeei*.

MATERIAL EXAMINED: *Utah*: Monument Valley, San Juan County, June 2, 20, 1953 (R. E. Ryckman, M. Walter), male holotype, in the American Museum of Natural History, female allotype, in the California Academy of Sciences, male paratype, in the Ryckman collection. *California*: Sequoia National Park [Tulare County], July 18, 1931 (A. T. MacClay), one male, in Usinger's collection; Three Rivers, Tulare County, July 17, 1952 (M. Cazier, W. Gertsch, R. Schrammel), one male, in the American Museum of Natural History; La Grange, Stanislaus County, June 2, 1956, June 22, 1957 (R. P. Allen), two males, in the California Insect Survey; Ojai [Ventura County], August 15, 1936 (W. E. Simonds), three males, in the Los Angeles County Museum; Bouquet Canyon, Los Angeles County, August 6, 1937 (N. Westerland), one male, in the Los Angeles County Museum. *Texas*: Chisos Mountains, Brewster County, June 27, 1959 (D. J. and J. N. Knull), one male, in the United States National Museum.

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